CLAIMS

1. A method for improved ultrasound imaging, said method comprising:

encoding an ultrasound signal with a code to produce an encoded ultrasound vector;

transmitting from a first location said encoded ultrasound vector at a desired angle;

receiving at a second location an encoded echo signal produced in response to said encoded ultrasound vector; and

decoding said encoded echo signal using said code used to produce said encoded ultrasound vector.

2. The method of claim 1, further comprising determining a position of a structure producing said encoded echo signal in response to an impact by said encoded ultrasound vector.

3. The method of claim 2, wherein said determining step further comprises determining said position based on a time of transmission of said encoded ultrasound vector, a time of reception of said encoded echo signal, and a strength of said encoded echo signal.

4. The method of claim 3, wherein said determining step further comprises determining said position based on an angle of transmission of said encoded ultrasound vector.

5. The method of claim 3, wherein said time of transmission is determined based on said code.

6. The method of claim 1, further comprising:

transmitting from said first location a plurality of encoded ultrasound vectors at a plurality of angles;

receiving at said second location a plurality of encoded echo signals produced in response to said plurality of encoded ultrasound vectors; and

obtaining an image of an object based on said encoded ultrasound vectors and said encoded echo signals.

7. A method for obtaining ultrasound images at an improved acquisition rate, said method comprising:

encoding a plurality of ultrasound signals for a frame with distinct codes;

sequentially transmitting from a first location said plurality of ultrasound signals at a plurality of angles;

receiving at a second location distinct from said first location a plurality of echo signals formed based said plurality of ultrasound signals; and

decoding said plurality of echo signals using said plurality of distinct codes.

8. The method of claim 7, wherein each echo signal is decoded using a code used to encode an ultrasound signal producing said echo signal.

9. The method of claim 7, wherein said decoding step further comprises decoding said plurality of echo signals offline concurrently with said transmitting step and said receiving step.

10. An improved ultrasound imaging system, said system comprising:

an encoder for encoding an ultrasound signal with a code for transmission to form an encoded ultrasound signal;

a transmitter for transmitting said encoded ultrasound signal; and

a receiver for receiving an encoded echo signal produced based on said encoded ultrasound signal, wherein said receiver decodes said encoded echo signal to produce a decoded echo signal.

11. The system of claim 10, wherein said transmitter comprises a transducer array for transmitting said encoded ultrasound signal.

12. The system of claim 11, wherein said receiver comprises a transducer element of said transducer array, wherein said element is not used for transmitting said encoded ultrasound signal.

13. The system of claim 10, wherein said encoder encodes a plurality of ultrasound signals for transmission with a plurality of codes.

14. The system of claim 13, wherein said codes comprise distinct codes for each ultrasound signal within a frame.

15. The system of claim 10, wherein said transmitter sequentially transmits a plurality of encoded ultrasound signals.

16. The system of claim 15, wherein said transmitter sequentially transmits said plurality of encoded ultrasound signals at a plurality of angles.

17. The system of claim 10, further comprising a processor for determining a position of a scatterer producing said encoded echo signal in response to an impact by said encoded ultrasound signal.

18. The system of claim 17, wherein said processor determines said position of said scatterer based on a time of transmission of said encoded ultrasound signal, a time of reception of said encoded echo signal, and a strength of said encoded echo signal.

19. The system of claim 18, wherein said time of transmission is determined based on said code used to encode said encoded ultrasound signal.

20. The system of claim 17, wherein said processor further determines said position of said scatterer using an angle of transmission of said encoded ultrasound signal.

21. The system of claim 17, wherein said processor determines said position as additional encoded ultrasound signals are transmitted by said transmitter and additional encoded echo signals are received by said receiver.